

# SOME PARASITES OF THE PRAIRIE MOLE, *SCALOPUS AQUATICUS MACHRINUS* (RAFINESQUE)<sup>1</sup>

JOHN R. OLIVE

Department of Zoology, Colorado A & M College,  
Fort Collins, Colorado

A parasitological examination of 42 specimens of prairie moles, *Scalopus aquaticus machrinus* (Rafinesque), taken in Perry, Champaign, and Franklin Counties, (Ohio) was undertaken to determine: (1) the species of parasites of the host, (2) the percentage of infection of moles with each species of parasite, and (3) the mean incidence of infection of the host.

The moles were obtained by trapping with the harpoon type of mole trap (Olive, 1946), and all but one of the animals were dead when recovered from the trap. Parasites were removed from the moles as soon as possible after trapping and were preserved in alcohol.

## ECTOPARASITES

### *Atricholelaps glasgowi*

The mite, *Atricholelaps glasgowi* (Ewing), was recovered from 37 moles of both sexes, which represented an infection of 90.4%. The number of mites per host varied from 1-120 with a mean incidence of 11.4.

The most heavily infected mole was an immature male from which 120 mites were recovered. The mites had caused a dermatitis on the sides and back of this animal, and apparently had loosened the fur in the head and neck region. Much of the fur was matted with excreta of the mites. The general condition and appearance of this mole showed evidence of malnutrition. It seemed that the constant irritation by the mites had affected the feeding of the mole, since, at the time of examination, the stomach contained only digestive juices while the small intestine contained parts of several June beetle larvae and grass roots.

None of the other mite-infected moles showed any evidence of being affected. It is conceivable, however, that mites may become a limiting factor in a mole population since Olson and Dahms (1946) found that *Liponyssus bacoti*, the tropical rat mite, produced a fatal anemia in laboratory animals that had become accidentally infected with the mite.

These authors attributed the deaths to anemia rather than toxic products produced by the mite, since the hosts "demonstrated a progressive blanching of the skin, which could be attributed to a loss of blood."

Two specimens of *A. glasgowi* were sent to Dr. E. W. Baker of the U. S. National Museum for confirmation of the identification.

### *Siphonaptera*

A single species of flea, *Ctenophthalmus pseudagyrtus* Baker, 1904, was recovered during this study.

This flea was found on 35 moles. This represented an infection of 83.3%. The number of fleas per host varied from 1-43 with a mean incidence of 7.

There was no evidence of any damage having been done to the host by this parasite.

### *Coleoptera*

The one species of beetle, *Leptimus testaceus* Mueller, 1817, recovered from 2 moles represented a percentage of infection of 4.7% with an incidence of 1.5.

<sup>1</sup>The investigation was conducted at the Ohio State University, Columbus, Ohio.

The first 3 specimens of this beetle were taken from a live mole. This is of particular interest since there is some controversy as to whether this beetle is a parasite. Comstock (1933) stated "Whether it (*L. testaceus*) is a parasite or merely a guest has not been definitely determined." Other entomologists suggested that the beetle might be feeding upon mites or dandruff scales found on the host. Morphologically it could well be a parasite. The dorso-ventral flattening and the presence of a tarsal claw are suggestive of a parasitic mode of life. It may be that the beetles left the moles very soon after death, not remaining nearly so long as the other ectoparasitic forms. It, therefore, might have been recovered more often if it had been possible to examine more living moles, or to have obtained and examined the hosts very soon after death.

#### ENDOPARASITES

##### *Nematoda*

The roundworm *Physaloptera limbata* Leidy, 1856, was the only nematode found; it was recovered from 6 moles, both males and females being infected. This represented an infection of 14.0% with a mean incidence of 1.3. Never more than two worms were found in a single host.

*Physaloptera limbata* was found only in the stomach. In cases where the worm was still attached, it was usually near the pylorus. These worms had no visible effect on the nutrition of the moles. However, there was evidence of a pathological condition resembling a mild gastritis in the stomach of one animal. There was some ulceration of the stomach wall where a worm had apparently been attached at some previous time. Monnig (1938) observed that *Physaloptera* occasionally change their site of attachment and leave wounds that continue to bleed. The mucosa then may become inflamed with subsequent erosion of the epithelium.

It would seem that secondary invaders might be of serious consequence if a great number of these worms were present.

##### *Acanthocephala*

The spiny-headed worm *Moniliformis clarki* (Ward 1917) Van Cleave 1924 occurred in 6 males representing both sexes of the host. There was an infection of 14.2%. From 1-10 worms per host were recovered representing a mean incidence of 1.9.

In all the moles *M. clarki* was attached to the mucosa of the small intestine. These worms were located at distances varying from 10 centimeters to 30 centimeters from the pylorus. There was a firm attachment to the intestinal wall, and the head of the worm was always directed anteriorly. The medium surrounding the parasites was semi-liquid, well digested food.

The heaviest parasite burden of this worm was in a mole trapped in the city of Columbus, Ohio. Ten mature worms were attached between 35 to 37 centimeters from the pylorus. Despite the fact that the intestine was distended and partially obstructed by the presence of these worms, there was no evidence of any nutritional or pathological condition in the host. There was, however, a slight mechanical injury caused by the attachment of the hooks of the proboscis.

In general, the incidence with *M. clarki* was greatest in urban areas.

Several specimens of *M. clarki* were sent to Dr. Asa C. Chandler of Rice Institute for verification of the identification.

##### *Cestoidea*

A single genus of tapeworm, identified as *Hymenolepis* sp., was taken from 2 moles. The percentage of infection was 4.76% with an incidence of 1.4.

In all, only 3 tapeworms were recovered. They were located high in the small intestine. While in each case the scolex of each worm was free from the intestinal

wall, there was no evidence of the worms having migrated. Apparently the tapeworms had become detached from the intestinal wall upon death of the host.

No apparent damage was caused by this tapeworm. Since it is a relatively small worm, its nutritional requirements are undoubtedly negligible. However, it is conceivable that if it were present in large numbers, it might rob the host of sufficient food to produce the type of symptoms associated with tapeworm infection.

#### DISCUSSION

The incidence of infection of the 42 moles examined during this investigation is strikingly low as compared with that of other small mammals in this area as shown by Katz, 1938; Ellison, 1942; Koutz, 1944. It is believed that there are two possible explanations for this condition. First, the moles' subterranean habitat forms a mechanical barrier against the parasites of surface dwelling animals and, therefore, the parasites are not shared. Parasite ova voided in the feces of other animals would seldom find their way into the moles' feeding area. Second, earthworms make up the greatest part of the moles' food, (Jackson 1915). Apparently earthworms do not serve as intermediate hosts of parasites of the mole.

Despite the fact that the incidence of infection was low, the percentage of infection was extremely high (97.3%). There was only 1 mole in this survey that was entirely free from parasites. Since this specimen had been dead about 4 hours, it is unlikely that external parasites would have left the body in this length of time. This mole was trapped in an area from which other parasitized moles had been taken, thereby precluding the fact that the area was free of infestation. It would seem that this specimen had failed to contact infective stages of parasites, or, having contacted them, was immune to infection.

Again, since this was an immature mole, the absence of internal parasites might possibly be explained by the fact that the mole may not have been foraging long enough to have acquired an infection.

It is more difficult to explain the absence of ectoparasites, since it is highly probable that they would have been acquired through contact with parasitized moles or from infected nests.

#### SUMMARY

1. Six species of parasites were recovered from 42 moles.
  - a. The mite, *Atricholelaps glasgowi*, (Ewing). This mite was recovered from 90.4% of the hosts with a mean incidence of 11.4;
  - b. The flea, *Ctenophthalmus pseudagyrtis* Baker, 1904. This occurred in 83.3% of the moles with a mean incidence of 7.0;
  - c. The beetle, *Leptinus testaceus* Mueller, 1817, was recovered from 4.76% of the hosts with an incidence of 1.5;
  - d. The roundworm, *Physaloptera limbata* Leidy, 1856, was recovered from 14.0% of the moles with a mean incidence of 1.3;
  - e. The spiney-headed worm, *Moniliformis clarki* (Ward 1917), Van Cleave, 1924. This worm was taken from 14.2% of the moles with a mean incidence of 1.9;
  - f. A tapeworm, *Hymenolepis* sp., was recovered from 4.7% of the hosts with an incidence of 1.4.
2. The percentage of infection with all parasites was 97.3% whereas the incidence of infection was 17.3.
3. In general the parasites had little effect on the condition of the host. Only 2 pathological conditions could possibly be attributed to parasitism. These were: (1) a dermatitis probably caused by *A. glasgowi*, and (2) gastritis which may have been caused by the attachment of *P. limbata*.

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